CLAIMS

1. A method of producing suspended elements for electrical connection between two portions of a micro-mechanism that can move relative to one another on a semiconductor wafer, forming a layer of sacrificial material comprising a thin film with at least one adhesive side that is applied dry to a surface of the micro-mechanism, forming electrical connection elements on the layer of sacrificial material, and removing the layer of sacrificial material beneath the electrical connection elements..

2. The method of Claim 1, wherein the thin film is adopted to function as an immobilizing structure for the micro-mechanism.

3. The method of Claim 2, wherein the thin film is applied to the front surface of the semiconductor wafer.

4. The method of Claim 1 wherein the thin film comprises a film of dry photosensitive resin.

5. The method of Claim 4, wherein the thin film is of the type known commercially by the name RISTON®.

6. The method of Claim 1, further comprising after the formation of the electrical connecting elements removing the thin film by oxygen-plasma etching.

7. The method of Claim 1, further comprising, after the formation of the electrical connection elements removing the thin film by immersion in a bath of NaOH.

8. The method of Claim 1, wherein the micro-mechanism comprises an electrostatic micro-actuator used for the fine positioning of a reading/writing transducer in a hard-disk reading/writing unit.

9. The method of Claim 8, further comprising, after the application of the thin film, selectively removing the thin film in order to provide open areas for the anchorage of the electrical connection elements to the fixed portion and to the movable portion of the micro-actuator, and for the opening of at least one area for the anchorage of a plate for connecting the reading/writing transducer to the movable portion of the micro-actuator, the selective removal comprising forming on the thin film a hard mask with openings in the region of the anchorage areas and for the selective etching of the thin film.

10. The method of Claim 9, wherein forming the hard mask comprises depositing a layer of silicon dioxide or aluminum on the thin film at low temperature and selectively removing the silicon dioxide or aluminum layer by a photolithographic technique.

11. The method of Claim 10, further comprising, after the definition of the electrical connection elements, dividing the semiconductor wafer by cutting it into individual dice, each die incorporating a respective micro-actuator.

12. The method of Claim 11, further comprising the mounting of a respective reading/writing transducer on each die.

13. The method of Claim 10, further comprising, after the definition of the electrical connection elements gluing a respective reading/writing transducer onto each micro-actuator and soldering terminals of the transducer to the electrical connection elements of the respective micro-actuator, and then dividing the semiconductor wafer with the transducers mounted by cutting it into a plurality of individual dice.

14. The method of Claim 13, further comprising subsequent removal of the thin film.

15. A method of producing suspended elements between two portions of a micro-mechanism that move relative to one another on a semiconductor wafer, the method comprising:

applying the adhesive side of a dry film over the micro-mechanism on the semiconductor wafer to immobilize the moveable components without penetrating any cavities therein;

forming electrical connection elements on the layer of sacrificial material; and

removing the layer of sacrificial material beneath the electrical connection elements.

16. A method of producing suspended elements between two portions of a micro-mechanism that move relative to one another on a semiconductor wafer, the method comprising:

applying the adhesive side of a dry film over the micro-mechanism on the semiconductor wafer to immobilize the moveable components without penetrating any cavities therein;

selectively etching the dry film to form windows therein; and

depositing a conductive layer through the windows to form electrical connections.

17. The method of Claim 16, further comprising removing the dry film to release the removable components.

18. A method of producing suspended elements between two portions of a micro-mechanism containing components that move relative to one another on a semiconductor wafer, the method comprising:

applying the adhesive side of a dry film over the micro-mechanism on the semiconductor wafer to immobilize the moveable components without penetrating any cavities therein;

forming a mask on the dry film;

depositing, developing, and selectively removing a sacrificial layer from the mask and the dry film to form windows on the dry film;

opening the windows by selectively etching the dry film;

depositing a dielectric layer to cover the windows without penetrating any underlying cavities;

depositing a conductive layer that is attached to at least one moveable portion of the micro-mechanism; and

selectively removing the conductive layer and the dielectric layer.

19. The method of Claim 18, wherein applying the adhesive side of a dry film further comprises reducing the thickness of the wafer after the dry film has been applied.

20. The method of Claim 18, wherein applying the adhesive side of a dry film comprises a subsequent step of applying a second adhesive layer to a back surface of the semiconductive wafer, the second adhesive layer having an exposed adhesive surface.

21. The method of Claim 18, further comprising removing the dry film to release the moveable components.

22. The method of Claim 21, further comprising, after selectively removing the conductive layer and the dielectric layer and before removing the dry film:

dividing the wafer into dice;

attaching a slider to each die;

gluing the die and the attached slider to a gimbal; and

attaching wires to the die.

23. The method of Claim 21, wherein removing the dry film comprises removing the dry film by oxygen plasma etching.

24. The method of Claim 21, wherein removing the dry film comprises removing the dry film by immersion in a bath of NaOH.